

Serial No. 09/738,374
January 13, 2004
Reply to the Office Action dated September 17, 2003
Page 2 of 8

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-6 (canceled).

Claim 7 (currently amended): A piezoelectric oscillator unit comprising:
a circuit substrate including a cavity provided therein and a wall provided around
the cavity, the wall having a top surface with electrodes disposed thereon, the circuit
substrate having an oscillatory circuit mounted in the cavity thereof;
a vibrator package overlaid on said circuit substrate, said vibrator package
housing a piezoelectric member therein and said vibrator package having electrodes
provided on the bottom surface thereof which are bonded to said electrodes provided on
the top surface of the wall of said circuit substrate; and
an adhesive arranged between the top surface of said wall of the circuit substrate
and the bottom surface of said vibrator package to bond said circuit substrate and said
vibrator package together; A piezoelectric oscillator unit according to Claim 4, wherein
the circuit substrate is defined by a multilayer ceramic substrate, and the cavity is
disposed at the approximate center thereof to mount components; and
a transistor for oscillation and buffer amplification, a varicap diode, a multilayer capacitor, a chip thermistor for temperature compensation, and a chip resistor are surface-mounted within said cavity.

Claim 8 (currently amended): A piezoelectric oscillator unit comprising:
a circuit substrate including a cavity provided therein and a wall provided around
the cavity, the wall having a top surface with electrodes disposed thereon, the circuit

Serial No. 09/738,374

January 13, 2004

Reply to the Office Action dated September 17, 2003

Page 3 of 8

substrate having an oscillatory circuit mounted in the cavity thereof;

a vibrator package overlaid on said circuit substrate, said vibrator package
housing a piezoelectric member therein and said vibrator package having electrodes
provided on the bottom surface thereof which are bonded to said electrodes provided on
the top surface of the wall of said circuit substrate;

an adhesive arranged between the top surface of said wall of the circuit substrate
and the bottom surface of said vibrator package to bond said circuit substrate and said
vibrator package together; A piezoelectric oscillator unit according to Claim 1, further
comprising

a case arranged to receive said vibrator package; and

a shielding plate arranged on said case to hermetically seal said vibrator
package.

Claim 9 (currently amended): A piezoelectric oscillator unit comprising:

a circuit substrate including a cavity provided therein and a wall provided around
the cavity, the wall having a top surface with electrodes disposed thereon, the circuit
substrate having an oscillatory circuit mounted in the cavity thereof;

a vibrator package overlaid on said circuit substrate, said vibrator package
housing a piezoelectric member therein and said vibrator package having electrodes
provided on the bottom surface thereof which are bonded to said electrodes provided on
the top surface of the wall of said circuit substrate; and

an adhesive arranged between the top surface of said wall of the circuit substrate
and the bottom surface of said vibrator package to bond said circuit substrate and said
vibrator package together; A piezoelectric oscillator unit according to Claim 1, wherein

said circuit substrate includes via holes arranged to connect said electrodes
provided on the bottom surface of said circuit substrate to said electrodes provided on
said top surface of said circuit substrate wall.

Serial No. 09/738,374

January 13, 2004

Reply to the Office Action dated September 17, 2003

Page 4 of 8

Claim 10 (previously presented): A piezoelectric oscillator unit comprising:
a circuit substrate having an oscillatory circuit mounted thereon;
a vibrator package overlaid on said circuit substrate, said vibrator package
having a top surface and a bottom surface and housing a piezoelectric member therein
and said vibrator package having electrodes provided on the bottom surface thereof
which are bonded to electrodes provided on the top surface of said circuit substrate;
a shielding case covering said vibrator package so that said shielding case
contains said vibrator package; and
an adhesive arranged between the top surface of said vibrator package and said
shielding case to adhere said shielding case to said vibrator package

Claim 11 (previously presented): A piezoelectric oscillator unit comprising:
a circuit substrate having an oscillatory circuit mounted thereon;
a vibrator package overlaid on said circuit substrate, said vibrator package
housing a piezoelectric member therein and said vibrator package having electrodes
provided on the bottom surface thereof which are bonded to electrodes provided on the
top surface of said circuit substrate;
a shielding case covering said vibrator package so that said shielding case
contains said vibrator package; and
an adhesive arranged to adhere said shielding case to said circuit substrate;
wherein said shielding case is provided with protrusions, said circuit substrate is
provided with holes, each of said protrusions is inserted into a corresponding one of
said holes, and said protrusions are fixed in said holes by said adhesive which is filled in
said holes.

Claim 12 (original): A piezoelectric oscillator unit according to Claim 10, wherein
said adhesive is a thermosetting adhesive.

Serial No. 09/738,374

January 13, 2004

Reply to the Office Action dated September 17, 2003

Page 5 of 8

Claim 13 (original): A piezoelectric oscillator unit according to Claim 11, wherein said adhesive is a thermosetting adhesive.

Claim 14 (original): A piezoelectric oscillator unit according to Claim 10, wherein said adhesive is solder.

Claim 15 (original): A piezoelectric oscillator unit according to Claim 10, wherein said vibrator package is a quartz vibrator package.

Claim 16 (original): A piezoelectric oscillator unit according to Claim 11, wherein said protrusions of said shielding case are claws.

Claim 17 (original): A piezoelectric oscillator unit according to Claim 10, wherein the circuit substrate is defined by a multilayer ceramic substrate, and includes a cavity disposed at the approximate center thereof to mount components.

Claim 18 (original): A piezoelectric oscillator unit according to Claim 17, wherein said multilayer ceramic substrate includes a wall provided around the cavity.

Claim 19 (previously presented): A piezoelectric oscillator unit comprising:
a circuit substrate having an oscillatory circuit mounted thereon;
a vibrator package overlaid on said circuit substrate, said vibrator package housing a piezoelectric member therein and said vibrator package having electrodes provided on the bottom surface thereof which are bonded to electrodes provided on the top surface of said circuit substrate;
a shielding case covering said vibrator package so that said shielding case contains said vibrator package; and
an adhesive arranged to adhere said shielding case to said circuit substrate;

Serial No. 09/738,374

January 13, 2004

Reply to the Office Action dated September 17, 2003

Page 6 of 8

wherein the circuit substrate is defined by a multilayer ceramic substrate, and includes a cavity disposed at the approximate center thereof to mount components;

said multilayer ceramic substrate includes a wall provided around the cavity; and

said electrodes are provided at four corners of the top surface of the wall, and external electrodes are provided at four corners of the bottom surface of the wall.